

# **Including access and benefit sharing in the Post-2020 Global Biodiversity Framework: a submission from the Alliance of Bioversity International and the International Center for Tropical Agriculture**

**Purpose:** For consideration as part of the Post-2020 Global Biodiversity Framework process and by the 23<sup>rd</sup> meeting of the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA-23) of the Convention on Biological Diversity (CBD).

**Proponents:** The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)

**Scope:** consideration of access and benefit-sharing issues in the Post-2020 Global Biodiversity Framework should expand beyond Aichi Target 16's exclusive focus on the Nagoya Protocol, and promote the broader, mutually supportive implementation of the Nagoya Protocol and the International Treaty on Plant Genetic Resources for Food and Agriculture.

**Focus:** how access and benefit-sharing rules and practices could be included in the post-2020 framework.

## **1. Introduction**

The Alliance of Bioversity International (Bioversity) and the International Center for Tropical Agriculture (CIAT) is making this submission to the 23<sup>rd</sup> meeting of the Convention on Biological Diversity's Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA 23) as a contribution to the development of the Post-2020 Global Biodiversity Framework (Post-2020 Framework). This submission focuses on how access and benefit-sharing rules and practices could be included in the post-2020 framework.

In summary, we propose that consideration of access and benefit-sharing issues in the Post-2020 Framework should expand beyond Aichi Target 16's exclusive focus on the Nagoya Protocol,<sup>1</sup> and promote the broader, mutually supportive implementation of the Nagoya Protocol and the International Treaty on Plant Genetic Resources for Food and Agriculture.

We appreciate that the structure of the Post-2020 Framework is still not decided, including whether or not it will include, like the Aichi Targets, targets with nested milestones and indicators. Nonetheless, in section 3 of this submission, we propose draft text for a target, milestones and indicators, partly because this way of presenting ideas is familiar to those who are familiar with the Aichi Targets. If the Conference of the Parties to the CBD eventually adopts some other structure for the Post-2020 Framework, we believe that the basic content and elements that we introduce here can and should be included.

---

<sup>1</sup> Target 16 of the Strategic Plan for Biodiversity 2011-2020: By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.

In this context, we note that Target 15.6 of the Sustainable Development Goal (SDG) reflects this broader approach, promoting sharing of benefits and access to genetic resources ‘as internationally agreed’ without reference to Nagoya Protocol in particular, or any other particular agreement for that matter. Similarly, Indicator 15.6.1 refers to numbers of countries that have adopted ‘legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits’.<sup>2</sup> Ultimately, what we propose in this paper is fully consistent with SDG Target 15.6. However, our proposal goes one step further, building on Target 15.6 to focus on increasing the numbers of transactions that take place in the future that are subject to access and benefit-sharing rules, in support of conservation, sustainable use, equitable benefit sharing and sustainable development.

By way of introduction, we underscore that the three objectives of the Convention on Biological Diversity and of the Plant Treaty are identical: conservation and sustainable use of genetic resources and equitable sharing of benefits derived from their use.<sup>3</sup> Furthermore, in both agreements the access and benefit sharing (ABS) provisions are essential not only for equitable sharing of benefits (including monetary benefits, technology transfer, information exchange, scientific research partnerships, and capacity building), but also for promoting the objectives of conservation and sustainable use. Both agreements’ access and benefit-sharing provisions (and those of the Nagoya Protocol) are based on the fact that countries have the sovereign right to regulate access to genetic resources, and that access should be subject to prior informed consent. The Plant Treaty explicitly states it is in conformity with the CBD. Of course, the access and benefit-sharing systems created/promoted by the CBD and Nagoya Protocol on one hand, and the Plant Treaty on the other, are very different. The CBD and Nagoya Protocol generally promote bilateral access and benefit-sharing regulation and deal making, with providers and recipients mutually agreeing between themselves on access and benefit-sharing terms and conditions, subject to approval by a national competent authority. The Plant Treaty, in marked contrast, creates a multilateral system, whereby all Contracting Parties agree to virtually pool specified plant genetic resources and exchange them using a standard material transfer agreement (SMTA), which was consensually adopted by all Contracting Parties in 2006. Monetary benefits are paid to an international benefit-sharing fund that supports projects in developing countries to conserve and sustainably use plant genetic diversity (Manzella, 2013). National access and benefit-sharing systems implementing the CBD/Nagoya Protocol and the Plant Treaty are necessarily closely intertwined. Without coordinated, mutually supportive implementation measures at a national level, stakeholders are confused by which rules apply, and public authorities charged with the administration of these systems often lack confidence to make decisions given uncertainties about the relationships between the two ABS systems. Under these circumstances, the potential contributions of access and benefit-sharing to all three objectives of conservation, sustainable use and benefit sharing are undermined. Post-2020, the world cannot afford to promote these international agreements in isolation from one another. Their objectives can only be realized through coordinated, mutually supportive efforts. It is therefore essential that the Post-2020 Framework reflect this broader approach to ABS.

---

<sup>2</sup> Target 15.6 of the Sustainable Development Goals: Promote fair and equitable sharing of the benefits arising from the utilization of genetic resources and promote appropriate access to such resources, as internationally agreed. Indicator 15.6.1: Number of countries that have adopted legislative, administrative and policy frameworks to ensure fair and equitable sharing of benefits

<sup>3</sup> In addition, the objective of the Nagoya protocol, and the third objective of the Plant Treaty are also identical.

Furthermore, it is important to note that provisions of the CBD (Article 8j) and the Nagoya Protocol, promoting the rights of indigenous peoples and local communities, substantially overlap with those under the Plant Treaty promoting Farmers' Rights. They promote indigenous peoples and local communities' (IPLCs') and farmers' rights to share equitably in the benefits derived from the use of genetic resources; they underscore that traditional knowledge should be protected, and that IPLCs and farmers should be involved in decision making with respect to the management of genetic resources.

Finally, by way of introduction, we note that Nagoya Protocol Article 8 states that "each Party shall: [...] consider the importance of genetic resources for food and agriculture and their special role for food security" when developing national implementation laws or other mechanisms. As such, Article 8 provides space for developing access and benefit-sharing mechanisms, under the Nagoya framework, that respond to, and create policy support for, the ways that genetic resources are accessed and used, and benefits are shared, in the agricultural sector. ABS related goals within the Post-2020 Global Biodiversity Framework should embrace this aspect too.

For many years, Bioversity International has coordinated international projects promoting the mutually supportive implementation of the Nagoya Protocol and the Plant Treaty. In the next (second) section of this paper, we share a number of lessons we have learned in the course of this work. In the third section of the paper, based on those learned lessons, we propose elements that could be included in an ABS-related target or goal in the Post-2020 Framework, implementation mechanisms and indicators related to that target.

## **2. Lessons learned with respect to mutually supportive implementation of the Nagoya Protocol and the ITPGRFA**

Bioversity International and the International Center for Tropical Agriculture (CIAT) are two of the 15 international agricultural research centres supported by CGIAR. Bioversity International and CIAT have entered formed the Alliance, whose vision is food systems and landscapes that sustain the planet, drive prosperity and nourish people. Our Alliance mission is to deliver research-based solutions that harness agricultural biodiversity and sustainably transform food systems to improve people's lives.

For over 20 years, Bioversity has supported countries to develop access and benefit-sharing regulations in furtherance of agricultural research and development. Before the Nagoya Protocol entered into force, most of our technical assistance to countries focused on putting systems in place to implement (and use) the multilateral system of access and benefit-sharing (multilateral system) created by the Plant Treaty. After the Nagoya Protocol entered into force, it quickly became apparent to us, and to the national partners with whom we worked, that it was much more efficient to simultaneously develop systems to implement both the Plant Treaty and the Nagoya Protocol together, in mutually supportive ways. From local to global levels of activity, distrust between key actors in agriculture and environment sectors (both policymakers and stakeholders) has tended to undermine efforts to develop practical, useful access and benefit-sharing mechanisms under both the Plant Treaty and the CBD. The entry into force of the Nagoya Protocol presented an opportunity to "press the re-start button", and overcome historical distrust, by bringing key actors from the agriculture and environment sectors together to learn more about each other's perspectives and to develop rules, regulations and guidelines that implement the Nagoya Protocol and the Plant Treaty in coordinated ways.

As a reflection of this conviction, Bioversity sought out new partnerships with organizations that were expert in supporting implementation of the Nagoya Protocol to complement our own capacity to support countries implementing the Plant Treaty. To this end, we jointly coordinated a number of activities with the ABS Capacity Development Initiative, the CBD Secretariat and national Nagoya Protocol focal points (along with the Plant Treaty Secretariat and national focal points). These activities included: convening five workshops<sup>4</sup> to bring together national Nagoya and ITPGRFA focal points from over 35 countries to get to know one another, share perspectives, build trust and develop joint plans; developing decision making tools for policy development and stakeholders' day-to-day decision making;<sup>5</sup> and writing research articles focusing on mutually supportive implementation of the two agreements.<sup>6</sup> With the same partners, we developed, and provided oversight for, a project proposal entitled 'Mutually supportive implementation of the Nagoya Protocol and the Plant Treaty in Madagascar and Benin'<sup>7</sup>, which was supported by the Darwin Initiative.

Both the Governing Body of the Plant Treaty and Conference of the Parties of the CBD have welcomed the efforts of these organizations working together to promote mutually supportive implementation of the Nagoya Protocol and the Plant Treaty and encouraged them, and others, to engage in more such activities in the future.

Based on these activities, Bioversity has learned the following lessons, which it feels are important to share with SBSTTA, as it considers the post-2020 framework. We take the opportunity to add references to literature that confirm and underscore these lessons:

- It is logical and necessary to develop mechanisms to implement the Nagoya Protocol and Plant Treaty's multilateral system of access and benefit sharing in a coordinated manner, given their closely related nature: where one regime does not apply to a given genetic resource, or to a use of that resource, the other regime often does apply (Laird and Wynberg, 2012). This means that decision-making about the scope(s) and application(s) and administration(s) of the two systems within a country are necessarily inextricably linked (Chiarolla et al., 2012). Without cooperation/coordination between lead agencies within a country that are responsible for

---

<sup>4</sup> Details about these workshops are available at: <https://www.bioversityinternational.org/research-portfolio/policies-for-plant-diversity-management/mutual-implementation-of-nagoya-protocol-and-plant-treaty/?L=0>

<sup>5</sup> Joint Capacity Building Programme. 2018. *Decision-making tool for national implementation of the Plant Treaty's multilateral system of access and benefit-sharing*. Bioversity International, Rome. Available:

[https://cgspace.cgiar.org/bitstream/handle/10568/93396/Decision\\_JCBP\\_2018.pdf?sequence=6&isAllowed=y](https://cgspace.cgiar.org/bitstream/handle/10568/93396/Decision_JCBP_2018.pdf?sequence=6&isAllowed=y)

Joint Capacity Building Programme. 2017. *Mutually supportive implementation of the Nagoya Protocol and the Plant Treaty: Scenarios for consideration by national focal points and other interested stakeholders*. Bioversity International, Rome. Available:

[https://cgspace.cgiar.org/bitstream/handle/10568/96525/Mutually\\_Joint\\_2017.pdf](https://cgspace.cgiar.org/bitstream/handle/10568/96525/Mutually_Joint_2017.pdf)

<sup>6</sup> Halewood, M., Andrieux, E., Crisson, L., Gapusi, J., Mulumba, J. W., Koffi, E. K, Dorji, T., Bhatta, M. R., and Balma, D., 2013. 'Implementing 'Mutually Supportive' Access and Benefit Sharing Mechanisms Under the Plant Treaty, Convention on Biological Diversity, and Nagoya Protocol'. 9/1 *Law, Environment and Development Journal*.

Available at <http://www.lead-journal.org/content/13068.pdf>; Halewood, M., Otieno, G.; Nkhoma, C.; Kasasa, P.; Mulumba, J.W.; Gapusi, J.; de Jonge, B. (2016) Access and benefit sharing policies for climate resilient seed systems: matching global commitments with national realities. ISSD Africa Synthesis Paper. Available:

<https://cgspace.cgiar.org/handle/10568/79167>

<sup>7</sup> <https://www.bioversityinternational.org/darwin-benin-madagascar/>

administration of the Nagoya Protocol and the ITPGRFA, efforts to implement those agreements are frequently frustrated and do not operate smoothly (Halewood et al., 2013). Where there is strong cooperation and coordination between the two lead agencies, progress developing implementation mechanisms is faster, and the day-to-day implementation of the systems put in place is much more effective.

- Often individuals and organizations are reluctant or unable to finalize access and benefit-sharing agreements – even within the framework of collaborative research and development projects – because they are uncertain about what law applies to the genetic resource, or the use, or the organizations or individuals involved (Sikina and Jungcurt, 2009; Pauchard, 2017). Rules and processes to implement the Nagoya Protocol and the ITPGRFA’s multilateral system must be ‘in sync’ with one another, so that both the public administrators of those systems, and the stakeholders operating under them, can feel confident about which rules apply, how much flexibility they have to make decisions, and what they have to do to ensure compliance. This clarity is critical for increasing stakeholders’ confidence, and empowering them to act, both as providers and recipients of genetic resources.
- Most countries are not actively taking advantage of flexibilities in the CBD and Nagoya protocol to develop ABS rules and mechanisms tailored to the specificities of particular sectors, for example, rules for genetic resources for food and agriculture pursuant to Nagoya Protocol Article 8(c).
- Long-standing patterns of non-cooperation and distrust between lead agencies responsible for the implementation of the Plant Treaty and Nagoya Protocol (usually from agriculture and environment, respectively) can be effectively addressed by proactively engaging those agencies in exercises to develop mutually supportive mechanisms to implement both agreements.
- Effective implementation of the Nagoya Protocol and the Plant Treaty’s multilateral system requires more than developing new legislation and regulations. Indeed, new laws on their own, without adequate capacity to implement and use them, can end up as *de facto* barriers to access and benefit sharing (Pauchard, 2017). Capacity building is required to assist public authorities to make decisions and operate under the systems concerned, and for stakeholders within the countries to be able to take advantage of those agreements as either providers or recipients of genetic resources (Laird and Wynberg, 2012; Medaglia et al., 2014).
- Effective implementation requires national public authorities and stakeholders within implementing countries to appreciate how access and benefit-sharing rules can help them achieve conservation and sustainable use of biodiversity as well as important development outcomes (De Jonge and Korthals, 2006; Kamau, 2014; Morgera et al., 2014). For example, crop and animal genetic resources (and access to a diversity of those resources) play a critical role in developing crops and breeds that are adapted to climate change-related stresses (Boettcher et al., 2015; Lin, 2011). Under the CGIAR Research Program on Climate Change, Agriculture and Food Security, Bioversity has provided training to national, multi-stakeholder teams on how to identify crop genetic resources in collections around the world that are potentially adapted for use in local climate-stressed conditions within partnering countries. It then supported them to acquire those materials under the Plant Treaty’s multilateral system or the Nagoya Protocol, depending upon which applied. Bioversity has also supported national public organizations and communities in implementing those agreements in ways that support further such use and benefit-sharing in the future.

- Additional efforts are necessary to support indigenous peoples and local communities (including farmers, in the lexicon of the Plant Treaty) to take advantage of both the Nagoya Protocol and the Plant Treaty. For example, many IPLCs require financial and technical support to assess the state of biodiversity they manage, to manage that diversity, to enter into useful partnerships with organizations from outside the community to conserve, to sustainably use, to provide or access genetic diversity, etc. (Shrumm, 2010). Depending on the needs and priorities of IPLCs, community biodiversity assessments, biodiversity registries, biocultural protocols, are among the range of tools and methods that they could be supported to develop, to assist them to make full use of the Nagoya Protocol and Plant Treaty's multilateral system.
- There is a widespread tendency to view ABS agreements as mere transactions of goods and services instead of as key instruments for facilitating and regulating collaboration among users of genetic resources, from local communities to private industry (Laird and Wynberg, 2005). This tendency results in missed opportunities for the generation and sharing of non-monetary benefits. More effort is needed to quantify, measure and monitor non-monetary benefits, and how they are shared (Drucker and Caracciolo, 2012). In the absence of such information, discussions concerning the success or failure of ABS systems continue to focus primarily on monetary benefit sharing. Monetary benefit-sharing is clearly important, but efforts to increase monetary benefit sharing should not be exclusive of efforts to evaluate and promote the enhanced use of ABS rules to generate non-monetary benefits.

The proposals we make in the following section concerning an ABS-related target and associated indicators build on, and reflect, these lessons learned.

### **3. Proposed elements of an ABS-related target, and associated indicators, to be included in the Post-2020 Framework**

#### ***Proposed target***

Transfers of genetic resources and benefit-sharing, compliant with national laws implementing international access and benefit-sharing conventions, have increased by at least 10% per year until 2035, compared to 2020<sup>8</sup>, to promote conservation, sustainable use, benefit-sharing and the development of new cultivars and breeds, new medicines and new biotechnologies as needed to ensure food and nutrition security and health.

#### ***Proposed milestones***

By 2025, all countries have ratified the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, and the International Treaty on Plant Genetic Resources for Food and Agriculture.

---

<sup>8</sup> The increased transfers reflect a predicted increased in demand for, and use of, genetic resources and traditional knowledge as a combined result of a number of factors including incentives provided by functional access and benefit sharing systems, accelerating technological developments, increasing R&D capacities of developing countries and IPLCs, climate changes, etc.

All parties have put in place administrative, legislative and policy measures and procedures to implement the Nagoya Protocol and the Plant Treaty ensuring mutually supportive implementation between the two.

All parties have adopted national strategies and measures to implement the CBD and Nagoya Protocol in ways that reflect and support sector-specific uses of genetic resources and related benefit sharing.

ABS mechanisms have been integrated into national development plans and strategies to enable to utilization of genetic resources (and related benefits) in pursuit of development objectives.

Genetic resources provider and user groups (e.g., IPLCs, public and private research and development) have capacities to operate under, and take advantage of, access and benefit-sharing systems.

### ***Possible indicators and baseline information***

#### *Regarding development and implementation of national laws:*

Number of countries that have ratified the Plant Treaty and Nagoya Protocol.

Number of countries that have put in place administrative, legislative and policy measures and procedures to implement the Nagoya Protocol and the Plant Treaty ensuring mutually supportive implementation between the two.

Number of countries with strategies/measures to implement CBD and Nagoya Protocol in ways that reflect and support sector-specific uses of genetic resources and related benefit sharing.

#### *Regarding compliance by research and development organizations:*

Number of research and development organizations (public and private) that have formally adopted guidelines, codes of conduct, protocols or standards in relation to ABS.

Number of transfers of genetic resources and the sharing of benefits derived from their use in compliance with national laws implementing international access and benefit-sharing agreements.

#### *Regarding increased transfer of genetic resources:*

Number of permits or their equivalents notified to the ABS-CH and agreements as reported by countries to the CBD Secretariat on the ABS-CH or through national reports to the CBD/COP, and number of SMTAs as reported to the ITPGRFA Secretariat.

Number of new accessions in global, regional, national, and private genebanks.

#### *Regarding increased monetary benefit sharing:*

Amount of money in the benefit-sharing fund of the ITPGRFA and other existing or future ABS funds, and cumulatively shared in ABS agreements reported on the ABS-CH or in national reports to CBD/COP, and the number of recipients of those funds.

#### *Regarding increased non-monetary benefit sharing:*

Estimated economic and social value of the non-monetary benefits<sup>9</sup> shared under ABS agreements or in the context of collaborative agreements for the utilization of genetic resources.

*Regarding empowering IPLCs:*

Numbers of IPLCs that have developed biodiversity community protocols or other tools for engaging in ABS agreements as either providers or recipients. Numbers of national-level implementation mechanisms that recognize/accommodate IPLC protocols or other tools in some way.

*Regarding embedding ABS mechanisms in sustainable development agendas:*

Number of countries that have integrated ABS within national development strategies and plans including National Biodiversity Strategies and Action Plans (NBSAPs), National Climate Change Adaptation Programmes of Action (NAPAs), National Climate Change Adaptation Plans (NAPs), rural development strategies, national poverty alleviation plans, national strategies for enhancing the rights of indigenous peoples and local communities and farmers, national agriculture development plans and national development strategies.

*Regarding capacity building*

Number of people trained to engage in their sector-specific activities in compliance with, and taking advantage of, ABS rules.

Funds invested by national and international projects to raise stakeholders' capacities to apply ABS approaches for development goals.

## **Implementation strategy**

A number of international initiatives and bodies have been created under the auspices of the CBD, Nagoya Protocol, Plant Treaty and FAO Commission on Genetic Resources for Food and Agriculture to support mutually supportive implementation of the Nagoya Protocol and the Plant Treaty. One of them is the Joint Capacity Building Programme for Developing Countries on Implementation of the Plant Treaty and its Multilateral System of Access and Benefit sharing (Joint Capacity Building Programme), which is convened by the Plant Treaty Secretariat and endorsed by the Plant Treaty's Governing Body. In recent years, the Joint Capacity Building Programme has modified the scope of its activities to ensure that national systems to implement the Plant Treaty's multilateral system are mutually supportive with systems implementing the Nagoya Protocol. Initiatives under the Nagoya Protocol framework include the Strategic Framework for Capacity Building and Development to Support the Effective Implementation of the Nagoya Protocol and the Informal Advisory Committee on Capacity Building. This strategy framework calls for the establishment of mechanisms to "Promote mutual supportiveness of capacity-building and development initiatives for implementation of the Protocol and of other international instruments on access and benefit-sharing". As stated above, the Governing Body of the

---

<sup>9</sup> We understand the difficulties of measuring this. We are suggesting that one, or some combination, of the governing bodies of the Convention on Biological Diversity, the Nagoya Protocol, the ITPGRFA and/or the CGRFA should explore possible indicators that are feasible and reliable for measuring/monitoring non-monetary benefit sharing promoted through ABS rules and agreements.



Plant Treaty and the COP for both the CBD and the Nagoya Protocol have recognized the efforts of the Plant Treaty and CBD Secretariats working with other organizations to promote mutually supportive implementation, and called for more such work in the future. The Alliance of Bioversity International and CIAT will continue to play an active role in this regard. The Commission on Genetic Resources for Food and Agriculture has a long-standing set of activities fostering dialogue and developing decision-making tools for national implementation of the Nagoya Protocol in ways that support agricultural research and development. The Commission's ABS Elements aim to assist ABS legislators, policy- and decision-makers to take into account the importance of genetic resources for food and agriculture, their special role for food security and the distinctive features of their different subsectors, while complying with the applicable international instruments. These international organizations should further enhance their cooperation to: promote mutually supportive implementation of the Nagoya Protocol and the Plant Treaty; promote ABS mechanisms that respond to sectoral specificities when necessary, and develop methods to measure, monitor and promote non-monetary benefit sharing.

At the national level, countries should develop mechanisms for ensuring coordination and collaboration among the agencies in charge of implementing ABS provisions under different international agreements. Some countries have already established multi-stakeholder coordination committees that include representatives of relevant ministries and directorates, as well as non-governmental organizations. These committees could be used as models for other countries to consider.

To realize ABS systems' contributions to development goals, countries should integrate ABS more thoroughly in their national conservation, economic development and climate change adaptation strategies and action plans.

United Nations (UN) agencies, the Global Environment Facility (GEF) and other international donors should provide financial support for mutually supportive implementation. Countries should make necessary investments in individual and institutional capacity building on ABS.

Governments should support the involvement of IPLCs in considering requests for access to genetic resources and associated traditional knowledge, and the equitable sharing of benefits, including through the development and implementation of community protocols. Equally importantly, but less frequently discussed, governments and aid agencies should develop systems and provide capacity building where necessary for IPLCs to be able to gain access to the genetic resources they need, for example, for adapting to climatic changes.

Governments should also promote and monitor the adoption of good practices, codes of conduct, protocols and standards by research organizations and private companies when accessing, utilizing and sharing genetic resources, consistent with the Nagoya Protocol and the Plant Treaty.

The ABS Clearing House mechanism (ABS-CH) of the Nagoya Protocol and the online reporting system of the ITPGRFA are useful tools to report transfers and these tools can be used to monitor numbers of agreements, flows of genetic resources.

Countries and stakeholders should develop and pilot new technologies for monitoring the flow and utilization of genetic resources and associated traditional knowledge, including by the business sector.

## References

- Boettcher PJ, Hoffmann I, Baumung R, Drucker AG, McManus C, Berg P, Stella A, Nilsen LB, Moran D, Naves M and Thompson MC (2015) Genetic resources and genomics for adaptation of livestock to climate change. *Front. Genet.* 5:461
- Cabrera Medaglia, J., Perron-Welch, F., and Phillips, F. K. 2014. Overview of national and regional measures on access and benefit sharing. Challenges and opportunities in implementing the Nagoya Protocol. Montreal: CISDL
- Chiarolla, C., Louafi, S., Schloen, M. 2012. An Analysis of the Relationship between the Nagoya Protocol and Instruments related to Genetic Resources for Food and Agriculture and Farmers' Rights. In *The 2010 Nagoya Protocol on Access and Benefit-sharing: Implications for International Law and Implementation Challenge*, eds. Buck, M., Morgera, E, Tsoumani, E. (Eds). Leiden: Brill
- De Jonge, B. and Korthals, M. 2006. Vicissitudes of benefit sharing of crop genetic resources: downstream and upstream. *Developing World Bioethics*, Vol. 6: 3, 144–157
- Drucker, A. and Caracciolo, F. 2012. The economic value of plant genetic resources for food and agriculture. In *Identifying Benefit Flows Studies on the Potential Monetary and Non-Monetary Benefits Arising from the International Treaty on Plant Genetic Resources for Food and Agriculture*, eds. N. I. Moeller and C. Stannard. Rome: FAO
- Halewood, M., Andrieux, E., Crisson, L., Gapusi, J., Mulumba, J. W., Koffi, E. K, Dorji, T., Bhatta, M. R., and Balma, D,. 2013. 'Implementing 'Mutually Supportive' Access and Benefit Sharing Mechanisms Under the Plant Treaty, Convention on Biological Diversity, and Nagoya Protocol'. 9/1 Law, Environment and Development Journal. Available at <http://www.lead-journal.org/content/13068.pdf>
- Kamau, E. C. 2014. Valorisation of genetic resources, benefit sharing and conservation of biological diversity: What role for the ABS regime. In *Ex Rerum Natura Ius? - Compulsion and problem perception in environmental law*, eds. O. Dilling and T. Markus. Baden-Baden: Nomos
- Laird, S. and Wynberg, R. 2012. Bioscience at a crossroad: Implementing the Nagoya Protocol on Access and Benefit Sharing in a Time of Scientific, Technological and Industry Change. Montreal: CBD
- Laird, S. L and Wynberg, R. 2005. The Commercial Use of Biodiversity: An Update on Current Trends in Demand for Access to Genetic Resources and Benefit-Sharing, and Industry Perspectives on ABS Policy and Implementation. Information document presented at the Fourth Meeting of the Ad Hoc Open-Ended Working Group on Access and Benefit Sharing. Granada, Spain, 30 January-3 February 2006. Montreal: CBD
- Lin, B. 2011. Resilience in Agriculture through Crop Diversification: Adaptive Management for Environmental Change. *BioScience* 61: 183–193
- Manzella, D. 2013. The Design and Mechanics of the Multilateral System of Access and Benefit Sharing. In *Crop Genetic Resources as a Global Commons: Challenges in International Governance and Law*, eds. M. Halewood, I. Lopez Noriega, and S. Louafi. Oxon: Routledge

Morgera, E., Tsioumani, E. and Buck, M. 2014. Conclusions. In *Unraveling the Nagoya Protocol. A Commentary on the Nagoya Protocol on Access and Benefit-sharing to the Convention on Biological Diversity*, eds. E. Morgera, E. Tsioumani, M. Buck. Neiden: Brill

Pauchard, N. 2017. Access and Benefit Sharing under the Convention on Biological Diversity and Its Protocol: What Can Some Numbers Tell Us about the Effectiveness of the Regulatory Regime? *Resources*, 6 (1)

Shrumm, H. (Ed.). 2010. IUCN-CEESP. Policy Matters 17: Exploring the Right to Diversity in Conservation Law, Policy, and Practice. Gland: IUCN

Sikina J. and Jungcurt S. 2009. Could Access Requirements Stifle Your Research? *Science*, Vol. 323 (5913), pp. 464-465